

What is claimed is:

1. Single crystal SiC wherein

heat treatment is performed in an inert gas atmosphere under a state where a cutting plane of a single crystal  $\alpha$ -SiC substrate which is formed by cutting along  $(1\ 1\ \bar{2}\ 0)$  Miller index plane  $\pm 10^\circ$ , and  $(2\ 2\ 0)$  Miller index plane of a polycrystalline  $\beta$ -SiC plate are superimposed on each other, whereby single crystal having a crystal orientation of an orientation of said cutting plane is integrally grown in said polycrystalline  $\beta$ -SiC plate in conformity with said single crystal  $\alpha$ -SiC substrate.

2. Single crystal SiC according to claim 1, wherein polycrystal which is produced in a plate-like form by a thermal chemical vapor deposition method is used as said polycrystalline  $\beta$ -SiC plate.

3. A method of growing single crystal SiC in which heat treatment is performed while superimposing a single crystal  $\alpha$ -SiC substrate and a polycrystalline  $\beta$ -SiC plate, wherein under a state where  $(2\ 2\ 0)$  Miller index plane of said  $\beta$ -SiC plate is superimposed on a cutting plane of said single crystal  $\alpha$ -SiC substrate which is formed by cutting along  $(1\ 1\ \bar{2}\ 0)$  Miller index plane  $\pm 10^\circ$ , said single crystal  $\alpha$ -SiC substrate and said polycrystalline  $\beta$ -SiC plate which are superimposed on each other are heat-treated in an inert gas atmosphere, whereby single crystal having a crystal orienta-

tion of an orientation of said cutting plane is integrally grown in said polycrystalline  $\beta$ -SiC plate in conformity with said single crystal  $\alpha$ -SiC substrate.

4. A method of growing single crystal SiC according to  
5 claim 3, wherein polycrystal which is produced in a plate-like form by a thermal chemical vapor deposition method is used as said polycrystalline  $\beta$ -SiC plate.

5. A method of growing single crystal SiC according to  
10 claim 3, wherein each of at least one cutting plane of said single crystal  $\alpha$ -SiC substrate, and at least one (2 2 0) Miller index plane of said polycrystalline  $\beta$ -SiC plate is processed into a smooth mirror face of 10 angstroms RMS or less.

6. A method of growing single crystal SiC according to  
15 claim 4, wherein each of at least one cutting plane of said single crystal  $\alpha$ -SiC substrate, and at least one (2 2 0) Miller index plane of said polycrystalline  $\beta$ -SiC plate which is produced in a plate-like form by the thermal chemical vapor deposition method is processed into a smooth mirror face of  
20 10 angstroms RMS or less.

7. A method of growing single crystal SiC according to claim 3, wherein a thin layer configured by  $\text{SiO}_2$ , Si, or a mixture of these materials is interposed in a superimposed portion of said cutting plane of said single crystal  $\alpha$ -SiC  
25 substrate and said (2 2 0) Miller index plane of said poly-

crystalline  $\beta$ -SiC plate.

8. A method of growing single crystal SiC according to claim 4, wherein a thin layer configured by SiO<sub>2</sub>, Si, or a mixture of these materials is interposed in a superimposed portion of said cutting plane of said single crystal  $\alpha$ -SiC substrate and (2 2 0) Miller index plane of said polycrystalline  $\beta$ -SiC plate which is produced in a plate-like form by the thermal chemical vapor deposition method.

9. A method of growing single crystal SiC according to claim 3, wherein a temperature of said heat treatment is set to be in a range of 2,100 to 2,300°C.

10. A method of growing single crystal SiC according to claim 4, wherein a temperature of said heat treatment is set to be in a range of 2,100 to 2,300°C.

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